THE ADVOCATE OF SCIENCE.

KNOWLEDGE IS POWER--HAPPINESS--VIRTUE.

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S. W. CORNER OF SIXTH AND CHERRY STREETS, PHILADELPHIA—TO WHOM ALL COMMUNICATIONS MAY BE ADDRESSED, POST PAID.

Published weekly, at One Dollar for Fifty Numbers, to be paid in advance.

In presenting to our patrons the first number of this publication, it is proper to explain exactly our design and motives.

Most of the periodical publications of this country, at the present time, may be ranked in two classes. To the one class belong those which are purely literary or scientific. These are few, and not liberally supported. It is very evident they do not suit the *popular* taste. To the other bclass elong much the greater number, which are generally conducted simply with the view to catch the most subscribers. I. is certainly true, though we are almost ashamed to record it, that the most popular and best supported publications of this country, are of a light and trifling character, calculated to amuse without instructing, to excite the passions at the expense of the understanding, to vitiate taste, and to corrupt morals. Fictitious narratives, anecdotes, riddles, and love-sick rhymes are in demand. And prizes and laurels are awarded to the productions of the imagination, while useful knowledge is almost wholly neglected.

That "knowledge is power," has become a very common-place remark. It means nothing more than that mental cultivation enables a man to acquire an ascendancy over his fellow men, which he could not acquire without it. In addition to this, we hold that knowledge is *happiness*;—that it is the source of the most refined and exalted pleasures, which, as creatures of this earth, we can enjoy. Further, knowledge is conducive to *virtue*, and consequently to religion.

We set out, therefore, with the proposition, that *knowledge is power, happiness and virtue.*

But every kind of knowledge is not equally valuable. Without inquiring at present what is the relative worth of the different kinds, the efforts of the Advocate of Science will be chiefly directed towards the diffusion of *scientific knowledge*, in the general acceptation of the term.

The younger classes of the community form the principal object of our concern. We desire to gain the ears of youth, before their habits of mind are settled. It is much easier to make new habits than to unmake old ones—to implant good habits than to eradicate bad ones. It were almost a hopeless task to execute a handsome piece of penmanship on a sheet which has been carelessly scribbled over, and blotted. Before the blemish can be erased, our paper is spoiled. Our labors should begin while the sheet is yet unsullied. No one will deny that much of the time of young persons, while their taste and habits are yet unformed, is devoted to useless and even injurious pursuits. This is an age of books and of reading; but the books and reading of this age are not always of the most useful kind. We promise to do all in our power towards promoting a taste for useful reading.

To enlarge the boundaries of science by brilliant discoveries in any of its branches, is not within our expectations. This task we leave to other journals; ours be the task of selecting from what is already known, those parts most useful and pleasing, with the hope of thus enticing our readers into the beautiful and varied paths of science. What is already known to some, we shall endeavor to make known to more. What is in the exclusive possession of scientific men, we shall strive to put in the possession of the unscientific. Like a schoolmaster who instructs *all* his pupils, we shall do our best to instruct *all* our readers. That tutor would be of little service to the majority of his pupils, who would confine his instructions to those who are farthest advanced, and teach nothing but what himself alone has discovered.

So much for the general design of the "Advocate of Science." Further than this, we leave it to speak for itself. The subscription price brings it within the reach of every individual.

Should the work be encouraged, the plan of publication adopted at its commencement may be improved. To parents—to those who have children under their care, we look more particularly for support. As our primary object is not pecuniary, we are willing to devote a portion of our time to the enterprize, even if not adequately compensated by the profits of the work.

TO SUBSCRIBERS AND READERS.

We date the first number of our paper in advance, designing to issue it weekly after that time. Meanwhile, our prospects will be partly ascertained, and arrangements made in accordance with them. The second number will, of course, be issued about a week after the date of this.

The essay on Geology in the present number, is the first of a series of articles on Geology, Botany, Natural History, &c., designed to convey an elementary knowledge of the Natural Sciences. The size of our publication will preclude very long essays on any subject, and will also be unfavorable to our making many original contributions to science. But should our patronage sanction such a course, we look towards the enlargement of the sheet.

The subject of Meteorology is one of growing importance. In another place will be found an interesting table concerning the past year. The next number will contain some remarks on the Aurora Borealis, with a table showing the relation of this phenomenon to the changes of our climate. We have also at our command, a quantity of Tables of Temperature, &c. for a great many years back, never yet published.

We contemplate noticing or reviewing such useful and scientific publications as present themselves to our inspection. Many of the numbers of Harpers' Family Library, the Library of Entertaing Knowledge, with various other works of the same class, are under consideration. The "Advocate of Science" may thus be accessory in encouraging scientific enterprize, and promoting the reading and circulation of useful books.

For the Advocate of Science.

GEOLOGY—NO. I.

In explaining, briefly and plainly, the principles of Geology, my readers must not be offended, if I write as if I considered them all entirely ignorant of the subject.

The term Geology is derived from two Greek words, *ge* the earth, and *logos* word or science. It is the science which treats of the structure of our globe. *Mineralogy* refers to the individual portions or substances which compose the earth, without any regard to the general arrangement of the mass. But *Geology* confines itself principally to an examination of the earth, considering it as a mass, composed of dissimilar parts, arranged in a particular order.

Those who are totally unacquainted with Geology, would be apt to think the earth a body homogeneous in its structure, or constructed of stones, clay and water, intermingled, as it were, at hazard. But this view is very erroneous. It is true we have no knowledge except of the superficial parts, forming the crust of our planet. This crust, however, is ascertained to consist of a series of layers or strata, some of which almost surround the globe. In this respect it is often compared to an onion, whose coats represent the strata. Now these strata are not, like the coats of the onion, extended in an even, continuous manner, over the whole circumference of the earth, but are occasionally broken or interrupted by a mountain, or by a lake or ocean. Sometimes one of the strata *runs out*, or terminates abruptly, without any evident cause. Frequently one district of country contains a stratum of a peculiar nature, not found elsewhere. When the extent of such a layer is very limited, it is called a *bed*.

If we ascend a mountain, we shall soon perceive a kind of rock not visible in the valley at its base, though at the same time existing there, at some distance beneath the surface. Rising higher on the mountain, we meet with another kind of rock, which was still deeper in the valley than the last. Finally, the summit is formed of a material which lay farthest from the surface in the valley.

If we imagine our planet to have once been a perfect sphere, with a level surface, composed of the strata regularly arranged around its centre, and then an explosion, or a number of explosions, to have taken place in the interior, bursting through the strata, and elevating them in some parts into mountains, in other parts depressing them into hollows, forming the beds of seas or lakes, we shall have no very inaccurate image of the present condition of the exterior of the earth. The natural consequence of such an eruption, would be the protrusion, at the place of bursting, of

those strata which were before hid under the surface; and the top of the projecting ridge would be made up of those materials which had previously been nearest to the earth's centre.

Our globe has never been penetrated by miners, more than a mile in perpendicular depth. The knowledge thus obtained, together with that derived from the inspection of mountains, and the effects of floods and currents of water, lead us to believe, that we are tolerably certain with regard to so much of the earth as lies within four or five miles of its surface. But what is this compared with its whole thickness? Not one thousandth part! The direct and positive knowledge of the geologist, with respect to the *central* portion of our planet, is therefore proportional to the knowledge we should gain concerning the interior of a common sized schoolglobe, by scratching through the coat of varnish on its surface. The geologist has been, moreover, most invidiously compared, as to the extent of his researches, to a mosquito attempting to ascertain the structure of an elephant, by boring through his hide. Should the mosquito succeed in piercing the skin of the elephant to a depth equal to one fourth the length of his little probosis, the comparison between the extent of his labors, and those of man on our planet, would be nearly exact.

I will penetrate the subject more deeply in my next number. S.

ANAGRAMS.

THIS word is from the Greek *ana*, backwards, and *gramma*, a letter. It consists in the transposition of the letters of a word or sentence, in any manner, so as to form some other word or sentence. Thus, the name of the famous Galen, or Galenus, makes *Angelus*, an angel; revolution makes *to love ruin*; astronomers, *moonstarers*; Julius, *Livius*, &c.

Anagrams were once in great demand, and were often treated with a superstitious regard. The anagram of Sir Edmondsbury Godfrey, whose death was imputed by some to the resentment of the papists, for exerting himself in the discovery of the popish plot, was found to be, *I find murdered by rogues*, or *by Rome's rude finger die*. The family of Lorraine took *alerions* for their armory, because that word is the anagram of their name. Calvin, in one of his books, styles himself by the anagram of Calvinus, *Alcuinus*—the name of a very eminent man in the time of Charlemagne. The compiler of this article has an old book called a "New Light of Alchemy," (but a very dark sort of book withal,) "by Micheel Sandivogius, i. e. anagramatically, Divi leschi genus amo"—I love the spirit of the divine law. When Micheel found this anagram, he no doubt believed he had divine authority for revealing the mysteries of the philosopher's stone!

The question put by Pilate to Christ, *quid est veritas?*—what is truth? admits of the anagram, *est vir qui adest*—it is the man who now stands before thee. This is considered the finest and happiest anagram extant.

The letters of the name *Napoleon* will form the following Greek sentence: on, Napoleon, o leon, apoleo oleon; or, I am Napoleon the lion, I destroy the city. That of *Thomas Jefferson* presents one of a no less striking, but quite a different character:—Host of man is free,

It appears by an anagram made by Roger Bacon, that he hit upon the ingredients of gunpowder, whilst searching after the philosopher's stone. Bacon speaks of his secret mixture in various parts of his works. In his treatise on the miracles of art and nature, he enumerates among his "strange experiments," "the making of thunder and lightning in the air: yea, with a greater advantage of horror, than those which are only produced by nature; for a very competent quantity of matter, rightly prepared, (the bigness of one's thumb,) will make a most hideous noise and corruscation." Instead, however, of declaring the ingredients plainly, he wraps them up in a mysterious anagram, saying it is prepared from the "*luru mopre can ubre*, of saltpetre and of sulphur." These barbarous syllables kept their secret so well, that it was nearly 500 years before it was discovered that they meant *pulveris carbonum*, or powdered charcoal. Newton himself first announced an important portion of his doctrine of fluxions by an anagram.

A certain Thomas Billon, received a pension of twelve hundred livres from Louis XIII, in quality of anagramatist to the king!

Cheerfulness and mirth favor digestion; great eaters are seldom accessible to sorrow.

METEOROLOGICAL SUMMARY,

FOR EACH MONTH OF THE YEAR 1832, WITH A SUMMARY FOR THE WHOLE YEAR, AND ALSO FOR THE YEAR 1831.

| | THERMOMETER. (deg.) | | | | | | | BAROMETER. (Inches.) | | | | | DAYS. | | | INCHES. | DAYS. | | | | | | |

daily, and the force of the wind represented by numbers. Thus 0 is calm, or nearly so; 1 is a light breeze, 2 a breeze, 3 a wind, 4 a high wind, and 5 a very high wind. The columns in question are formed by the average of these numbers.

The average yearly temperature of this latitude is a little above 52°. The year 1832 was therefore below the common standard. The preceding year was still colder, owing principally to the early onset of winter in November. In either year, the highest temperature is noted 88°. This is remarkable. Our summer seldom passes by without raising the temperature to 90°; it is sometimes up to 94° or 95°. Most thermometers, however, indicate a greater heat in summer than this, owing to an improper exposure of the instrument.

EFFECT OF CHEMICAL COMBINATION AND DECOMPOSITION.

An apple, Darwin says, during the process of putrifaction or fermentation, gives out 600 times its bulk of gas. This gas is principally carbonic acid, and is formed by the union of the carbon of the apple with oxygen; the latter derived partly from the apple, and probably in part from the atmospheric air. A common sized apple is therefore capable of supplying a barrel of this gas, which is the same sort as collects in wells &c., and destroys life, or at least cannot support it. When taken into the stomach the same gas is a wholesome stimulant, being the substance with which artificial mineral water is impregnated. It is worthy of remark, that although carbon and oxygen in combination form an air, to breathe which is fatal, yet the former is the most essential basis of our food, and the latter is the principle of the atmosphere, without which we could not breathe, or live a moment. Besides, carbon is much more abundant in nature than any other simple substance. But, happily, it has so close an affinity for other substances, that it is not easily separated in sufficient quantity to injure the atmosphere. Many of our most essential aliments, when analysed, are found to consist of the most deleterious ingredients. A beef-steak contains the components of prussic acid, one drop of which will cause death. Gum Arabic is said to yield, by chemical analysis, the same elements as the poison of the rattle-snake. A good dose of Epsom salts contains enough sulphuric acid, or oil of vitriol, to kill a horse.

A little knowledge of chemistry is apt to make great changes in one's opinions. Most of the uninformed would be surprised to hear that arsenic is not the least poisonous. In its metalic state this substance is entirely innocent; but when combined with oxygen, or the vital principle of the air, it becomes a deadly poison. The same of quicksilver—it is inert when uncombined, but forms corrosive sublimate, a deadly poison, when united chemically with one of the ingredients of common table-salt.

Muscular strength of Insects.—The muscles of some insects are much stronger in proportion to their size than those of large animals. A smart flee will jump two feet or more in a second. If a horse were to travel at the same relative speed, the President's Message might have been carried from Washington to New York in about an hour! Were the muscles of a man capable of the same exertions as those of a flee, we should want no boats to carry us across the Delaware, but we should skip over from Philadelphia to Camden, as we do across the gutters in the street!

A friend of ours relates an incident of a dog belonging to a gentleman near Bordentown, who accompanied several persons on a fishing excursion, to Crosswick's creek. While they were in the act of hauling their net up, a fine shad escaped from its interior, by swimming over the edge. The dog, who was quietly surveying their manœuvres, no sooner saw the prisoner transgress its bounds, than he plunged into the water, and quickly returning with the shad between his jaws, laid it on dry land to finish its gambols, while the fishermen thanked their dumb companion for one of the finest specimens in their collection.

Quicksilver, in its solid state, is erroneously considered as frozen. It is then quite malleable, and when fluid may be regarded as in a state of solution by heat.—*Malte Brun.*

We propose to insert in our journal, from time to time, a portion of selections from our miscellaneous reading, together with such comments as may suggest themselves to us. By stating the source whence the facts and observations thus collected are taken, we may perhaps induce some of our young readers to extend their reading, pleasantly and usefully to themselves.

MISCELLANIES.

1. We of the 19th century, have hard work to believe, that nearly all the sages of the world once ran mad after the *philosopher's stone*, which was to transmute the baser metals into gold. Yet so great a man as Newton, little more than a century and a half ago, held this language, in a letter to a friend, who was about to travel in France: "If you meet with any transmutations of metals out of their own species into another, (as out of iron into copper, out of any metal into quicksilver, &c.,) those above all will be worth your noting; being the most lucriferous, and many times, lucriferous experiments too, in philosophy."—*Fam. Library.*

2. Besides the visible perspiration or sweat, a large quantity of aqueous fluid is constantly passing out of the human body, through the lungs and skin. From the lungs, according to Magendie, more than a pint passes in twenty-four hours, in the vapor of the breath. During the same period, from one to five pints transpire insensibly through the skin. The cutaneous transpiration may be detected when the skin is apparently dry, by holding it close to a cold window-pane or a looking-glass.

3. Some writers have estimated the force with which the heart contracts, in driving the blood through the circulation, at 180,000 lbs.! Others again have reduced it to fifteen and even to eight ounces! Both these calculations are far from the truth. In an animal recently dead, the heart acted with a power sufficient to raise 20 lbs. —*Magendie.*

4. Frequently, in autumn, a fog fattens thrushes, ortolans, redthroats, &c. in 24 hours, so that they are unable to escape the sportsman. So says Bichat, an accredited French physician of great eminence. If the remark be true, the damp air must operate by checking the excretory action of the skin, and quickening the action of the absorbents. Perhaps an American fog has not so remarkable an effect.

5. It has been made a question whether children are naturally more prone to use the right hand than the left. Monro says that horses, dogs and other animals use their right legs more generally than their left. We believe men do the same in kicking, but we doubt, from our own observation, whether they do so much in hopping, stepping and performing other motions.

6. The coloring power of oxid of cobalt on vitrifiable mixtures, is perhaps greater than that of any other metal. One grain gives a full blue to 240 grains, or half an ounce, of glass.—*Brande.*

It is this metal which imparts its fine blue color to the smalt used in making signs. Some of the most beautiful minerals owe their color to substances which have no beauty when uncombined. Thus the violet of the amethyst is caused by iron and manganese,—nearly the dullest of all the metals.

7. About puberty, the neck increases very much in thickness. Hence, in some of the Mediterranean islands, a taxable age is determined by a string which goes just twice round the neck; the ends of the string are taken in the mouth, and if the loop passes readily over the head, the person is judged to be of age, and is taxed.—*Darwin.*

8. The medium quantity of air contained in the lungs is 145 inches; of which about 30 are changed at every respiration.—*Horner.*

9. *The effect of continued violent exertion upon the duration of life.*—The late Mr. Edgeworth, in his memoirs, repeatedly speaks of a boatman whom he knew at Lyons, as an old man. "His hair," says Mr. Edgeworth, "was grey, his face wrinkled, his back bent, and all his limbs and features had the appearance of those of a man of sixty; yet his real age was but 27 years. He told me he was the oldest boatman on the Rhone, that his younger brothers had been worn out before they were 25 years old: such were the effects of the hardships to which they were subject from the nature of their employment." That employment was by intense bodily exertion, and with the daily chance of being upset, to pull a boat across one of the most rapid rivers in the world.—*Working Man's Companion.*

10. *Scientific Stratagem.*—A very ingenious geologist, now living, was busily employed in making a collection of the lavas formed from the igneous currents of mount Ætna; the peasants were often troublesome to him, suspecting that he was searching for treasures. It occurred to him to make the following speech to them: "I have been a great sinner in my youth, and as a penance I have made a vow to carry away with me pieces of every kind of stone found upon the mountains. Permit me quietly to perform my pious duty, that I may receive absolution for my sins." The speech produced the desired effect; the peasants shouted, "the holy man! the saint!" and gave him every assistance in their power to enable him to form his collection.—*Davy's Consolations in Travel.*

INFLUENCE OF POSITION OF BODY ON THE MIND.

Different positions of the body, and different exercises, have a sensible influence upon the intellectual faculties. Descartes composed his works in bed. Mr. Brindley found a recumbent posture most favorable to the exertions of his genius, and hence we are told, he sometimes laid in bed for three days, when he was obliged to plan a new and difficult piece of machinery. Rousseau tells us in his confessions, that most of his original thoughts were suggested to him in bed. I have known many other instances, in which this posture of the body has proved favorable to the production of new, and the revival of old ideas. It is much assisted by the silence and darkness of night, and by the empty state of the stomach in the morning.

In some persons, the intellects are excited by a *standing* position. Colonel Charles Townshend, (so much admired in the British House of Commons, about sixty years ago,) was eloquent only when he stood upon his feet; and so sensible was he of it, that he would often rise from his seat at a convivial table, in order to give more force and charms to his conversation. The late judge Wilson, whose abilities and knowledge will never be forgotten by the friends of the revolution, and government of the United States, has assured me that his ideas always flowed most easily when he was upon his feet. This was so much the case, that I have repeatedly observed him when closely pushed in an argument, or deeply engaged in conversation, to rise from his chair in company, and occupy a fixed position, in a corner of the room. The late Sir Joshua Reynolds always painted in a standing posture. I need hardly add, that his pencil has given celebrity to the country in which he lived. *Walking* assists the operations of the intellectual faculties in an eminent degree. A sect of philosophers who were remarkable for studying and teaching while they were employed in this exercise, obtained from thence the name of Peripatetics, or Walking Philosophers. Rousseau derived many of his new ideas, he tells us, from walking amidst rocks and mountains. *Riding*, whether on horseback or in a carriage, favors thought; and hence the practice of some travellers to carry common-place books with them, to record their original thoughts the moment they occur, lest, in their number and variety, they should be lost before they reached the end of their excursion. Many of the elegant ideas of Mr. Pope, we are told, were excited in his brain by riding a trotting horse. The late Mr. Edwards found this mode of exercise to pour such a stream of new ideas into his mind, that in visiting his parishioners, he often retired from the road into the woods, and dismounted his horse, in order that he might, without interruption, empty the overflowings of his genius into his pocket memorandum book.—*Dr. Rush.*

IMPRESSION PRODUCED ON SAVAGES BY THE ART OF WRITING.

Some years ago, an European named Mariner, was held in captivity by the natives of the Tonga Islands. In the hope of obtaining his liberty, he wrote a letter with a solution of gunpowder as ink, on a piece of paper which he obtained from one of the natives; and he confided it to the care of a chief, with directions that it should be given to the captain of any ship which might appear on the coast. Finow, the king, however, having heard of the transaction, his suspicions were excited, and he immediately sent to the chief for the letter, and obtained it. When it was put into his hands, he looked at it on all sides; but not being able to make any thing of it, he gave it to Jeremiah Higgins, who was at hand, and ordered him to say what it meant. Higgins took the letter, and translated part of it, representing to Finow that it was merely a request to any English captain that might arrive, to interfere with the king for the liberty of Mr. Mariner. This mode of communicating sentiments was an inexplicable puzzle to Finow; he took the letter again and examined it, but it afforded him no information. After considering the matter a little within himself with no satisfaction, he sent for Mariner and desired him to write down something. The latter asked him what he should write? he replied, put down me. Mariner accordingly wrote Feenow, (spelling it according to the strict English orthography.) The chief then sent for another Englishman who had not been present, and commanding Mariner to turn his back and look another way, he gave the man the paper, and desired him to read what that was. The man pronounced aloud the name of the king; upon which Finow snatched the paper from his hand, and with astonishment, looked at it, turned it round and examined it in all directions. At length he exclaimed, "this is neither like myself nor anybody else! Where are my legs? How do you know it to be I?" and then without stopping for an explanation, he impatiently ordered Mariner to write something else; and thus employed him several hours in putting down the names of different persons, places and things, and making the other man read them. This afforded extraordinary diversion to Finow, and to all the men and wom. present, particularly as he now and then whispered a little love anecdote, which was strictly written down, and audibly read by the other, not a little to the confusion of one or other of the ladies present; but it was all taken in good humor, for curiosity and astonishment were the prevailing passions. How their names and circumstances could be communicated through so mysterious a channel, was altogether past their comprehension. Finow at length thought he had got a notion of it, and explained to those around him, how it was very possible to put down a mark or sign of something that had been seen both by the writer and reader, and which should be mutually understood by them; but Mr. Mariner immediately informed him he could write down any thing that he had never seen. The king directly whispered to him to put down Toogoo Ahoo, (the king of Tonga, whom he had aided to assassinate many years before Mariner's arrival.) This was accordingly done, and the other read it; when Finow was yet more astonished, and declared it to be the most wonderful thing he had ever heard of. He then desired him to write "Tarky," (the chief of the garrison of Bea, whom Mariner and his companions had not yet seen—he was blind in one eye.) When "Tarky" was read, Finow inquired whether he was blind or not. This was putting writing to an unfair test! and Mariner told him that he had only written down the sign standing for the sound of his name, and not for the description of his person. He was then ordered in a whisper to write "Tarky, blind in his left eye," which was done, and read by the other man, to the increased astonishment of every body. Mariner then told him that in several parts of the world, messages were sent to great distances through the same medium, and being folded and fastened up, the bearer could know nothing of its contents; and that the histories of whole nations were thus handed down to posterity, without spoiling by being kept. Finow acknowledged this to be a most noble invention, but added that it would not do at all for the Tonga islands; that there would be nothing but disturbances and conspiracies, and he should not he sure of his life, perhaps another month.—*Lib. of Entertaining Knowledge.*

The slaves of the Mameluke chiefs each styled their master father. When, in consideration of their services, they were liberated, they left their master's house, taking with them some property. The great badge of their liberty was permission to let their beards grow.—*Malte Brun,*